AMENDMENTS TO THE SPECIFICATION:

Before the paragraph beginning at page 1, line 4, insert the following:

--REFERENCE TO COMPUTER PROGRAM LISTINGS

A computer program listing appendix with twelve files is provided on a compact disc as part of the invention disclosure. The material of the twelve files on the compact disc is incorporated by reference. The files included on the compact disc are:

• generate-discretization.mu has a size of 6,241 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the program "generate-discretization", referred to as Appendix 1.

• preparations.mu has a size of 3,101 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the subroutine "preparations", referred to as Appendix 2.

• setup-equations.mu has a size of 17,414 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the subroutine "setup-equations", referred to as Appendix 3.

• solve-equations.mu has a size of 4,681 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the subroutine "solve-equations", referred to as Appendix 4.

• analyze-solution.mu has a size of 22,654 bytes and was created (stored on the CD-R) on December 12, 2006. This file

contains the subroutine "analyze-solution", referred to as Appendix 5.

- appendix6.txt has a size of 10,588 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the output for D100, Order 2, on the grid (-1,1)^3, optimize=0, referred to as Appendix 6.
- appendix7.txt has a size of 3,289 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the output for D100, Order 2, on the grid (-1,1)^3, optimize=1, referred to as Appendix 7.
- appendix8.txt has a size of 9,465 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the output for D100, Order 2, on the grid (-1,1)^3, optimize=2, referred to in the following as Appendix 8.
- appendix9.txt has a size of 47,206 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the output for D100, Order 4, on the grid (-2,2)^3, optimize=0, 30, referred to as Appendix 9.
- appendix10.txt has a size of 4,092 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the output for D100, Order 4, on the grid (-2,2)^3, optimize=1, referred to as Appendix 10.

• appendix11.txt has a size of 49,617 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the output for D100, Order 4, on the grid (-2,2)^3, optimize=2, 5, referred to as Appendix 11.

• appendix12.txt has a size of 16,572 bytes and was created (stored on the CD-R) on December 12, 2006. This file contains the output for D200, Order 2, on the grid (-1,1)^3, optimize=0, referred to as Appendix 12.--

Please replace the paragraph spanning pages 8 and 9 with the following:

--An example is a general one-dimensional discretization for a derivative at node i which uses the stencil between the nodes $i-m$ and $i+n$, where m and n are given positive integers. On the stencil $S=(i-m,i-m+1,\ldots,i-1,i,i+1,\ldots,i+n-1,\ i+n)$, the approximation of the first derivative can be written as

$$u_x = \frac{1}{\Delta x}\{a_{-m}u_{i-m} + a_{-m+1}u_{i-m+1} + \cdots + a_{-1}u_{i-1} + a_0 u_i + a_1 u_{i+1} + \cdots a_{n-1}u_{i+n-1} + a_n u_{i+n}\}. \quad (1)$$

The coefficients $\cancel{a_j, i-j \in S}$ $\underline{a_j,\ j \in S}$ determine the numerical properties of the discretization. A general description of the above discretization can be found in *D1* which discusses the method for obtaining the coefficients a_j. Expression (1) also generalizes to higher derivatives. --

Replace the paragraph beginning at page 47, line 16 with the following:

--The second derivative $\cancel{D_2 = \frac{\partial^2 u}{\partial e_1^{21}}}$ $\underline{D_2 = \frac{\partial^2 u}{\partial e_1^2}}$ can be expressed in the grid-based derivatives $u_{xx}, u_{yy}, u_{zz}, u_{xy}, u_{yz}$ and u_{zx} according to

$$\frac{\partial^2 u}{\partial e_1^2} = \cos^2\alpha\cos^2\beta\frac{\partial^2 u}{\partial x^2} + \sin^2\alpha\cos^2\beta\frac{\partial^2 u}{\partial y^2} + \sin^2\beta\frac{\partial^2 u}{\partial z^2} + 2\cos\alpha\cos^2\beta\sin\alpha\frac{\partial^2 u}{\partial x\partial y} + 2\cos\alpha\cos\beta\sin\beta\frac{\partial^2 u}{\partial x\partial z} + 2\sin\alpha\cos\beta\sin\beta\frac{\partial^2 u}{\partial y\partial z} \quad (21)$$

The terms $T_{xx}, T_{xy}, T_{xz}, T_{yy}, T_{yz}$ and T_{zz} are obtained by the computer program mentioned before, and are given in appendix 12. The stencils $T_{xx}, T_{xy}, T_{xz}, T_{yy}, T_{yz}$ and T_{zz} have been added in various quantities to the stencils $Tf_{xx}, Tf_{xy}, Tf_{xz}, Tf_{yy}, Tf_{yz}$ and Tf_{zz} to obtain the more symmetric representation of equation 20. This shows once more the use of the degrees of freedom, and the equivalence between two expressions for an approximation of D_p using a different Tf but sharing the basis described by the stencils.--

Replace the list of symbols beginning on page 54 with the following:

--List of symbols

A	an amplitude of a Fourier component
A', A''	intermediate bases in the transformation from the grid basis to the local basis B
a,b,c,...	components of the vector $\vec{a}$
$\vec{a}$	vector of preferential direction
$B(\vec{e}_1, \vec{e}_2, \vec{e}_3, \ldots)$	a local basis, with $\vec{e}_1$ along a preferential direction, i.e. $\vec{e}_1 // \vec{a}$
C_c	computational coefficients used in the approximation of D_p^A, which are dependent on the numerical formulation used
C_s	computational coefficients used in the approximation of D_p^A, in the Finite Difference formulation; weighting coefficients
$C_{l,m,n,\cdots}$	the weighting coefficients C_s for node $l,m,n,\cdots$
D_p	spatial p^{th} derivative, to be discretized
D_p^A	an approximation to D_p
D_p^{LC}	an approximation to D_p in the Finite Difference formulation, representing a linear combination of values

$D_p^{\alpha_i}$ an approximation to D_p in the Distribution Method, depending on the distribution coefficients α_i

$D_p^{\varphi,\psi}$ an approximation to D_p in the Finite Element formulation depending on the basis function φ and the test function ψ

f the flux

I the imaginary unit, such that $I^2 = -1$

$i, j, k, \cdots$ indices numbering the nodes of a structured grid

$i_{\max}, j_{\max}, k_{\max}$ maximum indices of a grid

I_{el} the integral of the derivative D_p over a volume, used in the Residual Distribution Method

M order of the error of a discretization

N number of dimensions

P the point where the derivative is computed

p index for a higher (p^{th}) derivative, or first derivative ($p = 1$)

$p_1, p_2, p_3, \cdots$ the powers of the derivatives with respect to $\vec{e}_1$, $\vec{e}_2$, ... in a mixed derivative

$q_1, q_2, q_3, \cdots$ arbitrary variables

r an integer summation index

$r_{\max}$ the maximum value of r in the summation

S the stencil : the set of points used in the computation of the approximation D_p^A

t the time coordinate

$t_{11}, t_{1,2}, \cdots$ coefficients used in the transformation between coordinate systems

T_β represent the terms in the discretization β resulting from degrees of freedom which remain when the approximated value D_p^A is optimized

u unknown at a grid point

u_s unknown at a point of the stencil S

u_α derivative of u with respect to α, e.g. $u_\alpha = \dfrac{\partial u}{\partial \alpha}$

$\vec{x}$ N-dimensional position vector

$\vec{\nabla}$ differential operator, $\left(\frac{\partial}{\partial x}, \frac{\partial}{\partial y}, \frac{\partial}{\partial z}, \cdots\right)^T$

α_i the distribution coefficient used in the Distribution Method for the distribution of the part $\alpha_i I_{el}$ or $\alpha_i f$ to node i

$\Delta x, \Delta y, \Delta z, \cdots$ the mesh spacings in the coordinate directions

Δt the time increment

$\frac{\partial u}{\partial x}$ partial p^{th} derivative ~~with~~ of u with respect to x

$\frac{\partial^p}{\partial x^p}$ derivative with respect to x

ε_n error term in D_p^A

ε_s error term in the expression of u_s using a truncated Taylor series expansion

$\vec{\kappa}$ the wave number vector

φ the basis function used in the Finite Element method for representing u over the element

ψ test function used in the integrals of the derivative in the Finite Element formulation

ω the angular frequency--